Disruption of NMDA Receptors in Oligodendroglial Lineage Cells Does Not Alter Their Susceptibility to Experimental Autoimmune Encephalomyelitis or Their Normal Development.

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Public Summary:
Pharmacological studies have suggested that oligodendroglial NMDA glutamate receptors (NMDARs) mediate white matter injury in a variety of CNS diseases, including multiple sclerosis (MS). We tested this hypothesis in experimental autoimmune encephalomyelitis (EAE), a model of human MS, by timed conditional disruption of oligodendroglial NR1, an essential subunit of functional NMDARs, using an inducible proteolipid protein (Plp) promoter-driven Cre-loxP recombination system. We found that selective ablation of oligodendroglial NR1 did not alter the clinical severity of EAE elicited in C57BL/6 mice by immunization with myelin oligodendrocyte glycoprotein peptide 35-55 (MOG-peptide), nor were there significant differences between the oligodendroglial NR1 KO and non-KO mice in numbers of axons lost in spinal cord dorsal funiculi or severity of spinal cord demyelination. Similarly, constitutive deletion of NR3A, a modulatory subunit of oligodendroglial NMDARs, did not alter the course of MOG-peptide EAE. Furthermore, conditional and constitutive ablation of NR1 in neonatal oligodendrocyte progenitor cells did not interrupt their normal maturation and differentiation. Collectively, our data suggest that oligodendroglial lineage NMDARs are neither required for timely postnatal development of the oligodendroglial lineage, nor significant participants in the pathophysiology of MOG-peptide EAE.

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